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VERBENA MOCTEZUMAE (VERBENACEAE), A NEW SPECIES FROM SONORA, MEXICO

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ABSTRACT

Verbena moctezumae Nesom & Van Devender, sp. nov., is described from east-central Sonora, Mexico, where it apparently is narrowly endemic to an area of basalt. The new species is distinct in its annual duration and reduced habit, essentially glabrous stems, persistent and oblanceolate, serrate-margined basal and lower cauline leaves 15–30 mm long, leaf surfaces, rachises, and calyces are densely and minutely stipitate- to subsessile-glandular, and short, solitary spikes with medium sized flowers. The strongly developed stem angles, thin leaves with non-revolute margins, and fruits with commissural faces reaching the nutlet tips suggest that it is most closely related to *V. menthifolia* and others of ser. *Verbena*.

KEY WORDS: *Verbena*, Verbenaceae, new species, Mexico, Sonora

As part of a project to document and summarize the flora of the state of Sonora, Mexico, many areas in the state have been floristically inventoried by Van Devender, Ana L. Reina-Guerrero, Richard S. Felger, J. Jesús Sánchez-Escalante, and others in recent years. The *malpais* basalt lava flows near Moctezuma is prime area of interest. The current status of the flora was recently summarized in Van Devender et al. (2009). All of the collections as well as observations are being entered into the Madrean Archipelago Biodiversity database (Madrean.org) at Sky Island Alliance, Tucson, Arizona. These studies have brought to light a previously undescribed species of *Verbena*.

Verbena moctezumae Nesom & T. Van Devender, sp. nov. (Fig. 1).

A *Verbenae menthifoliae* ac speciebus cognatae similis sed distinctus duratione annuo habitu redacto, caulibus quasi glabris, foliis rachidibus calycibusque dense minute stipitati-glandularibus, foliis basalibus proximalibus persistentibus parvis marginibus serratis nonrevolutis, et spicis brevibus solitariis floribus mediocribus.

TYPE: **Mexico**. Sonora. Mpio. de Moctezuma: 23.3 km SSE of jct with Moctezuma-Huásabas Hwy on road to Tepache (SON 117), 21.4 km (by air) SSE of Moctezuma, sparse open foothills thornscrub on basalt cobble plain; 29° 38' 08" N, 109° 33' 25" W; 701 m elevation; rare, widely scattered annual in dark brown clay soil among black rocks, 4 May 2010, *A.L. Reina-G. 2010-358* with T.R. Van Devender (holotype: ARIZ; isotypes: MEXU, US).

Plants herbaceous annuals from a slender, unbranched taproot. **Stems** 1(–4) from the base, erect to ascending-erect, 12–21 cm, strongly 4-angled, essentially glabrous or sparsely hirsute-strigose to strigillose with upturned hairs along the angles, hirsutulous at the very base, eglandular. **Leaves** mostly basal and proximal cauline, oblanceolate to narrowly oblanceolate, blades 15–30 mm x 3–5

mm, veins impressed adaxially, margins coarsely serrate with 3–5 pairs of teeth, not revolute or very narrowly so, hirsute and densely stipitate-glandular on both surfaces, basally attenuate, midcauline and above linear and entire. **Fruiting spikes** solitary, 1.5–5 cm, densely arranged and overlapping, the proximal looser; floral bracts narrowly lanceolate to narrowly ovate-acuminate, 3.5–3.8 mm, equalling or slightly shorter than the calyces; rachis densely stipitate-glandular. **Calyces** 3–4 mm, densely and minutely stipitate- to subsessile-glandular, hirsute only along the keel and lobes, lobes narrowly triangular, erect, not connivent. **Corollas** blue with prominently white throat, tubes 4–4.5 mm, 1–1.5 mm longer than the calyx, limbs 4–5 mm in diam. **Nutlets** ca. 2 mm, commissural faces extending completely to the nutlet tips, surface morphology not seen.

Additional collection. **Mexico**. Sonora. Mpio. de Moctezuma: 20.5 km SSE of jct with Moctezuma-Huásabas Hwy on road to Tepache (SON 117), basalt cobble plain with sparse open foothills thornscrub; 29° 38' 36" N, 109° 34' 32" W; 689 m elevation; rare annual, 26 Apr 2004, *Van Devender 2004-400* (TEX).

Verbena moctezumae is a distinctive species. The plants are small annuals and arise from a thin, unbranched taproot and would not be mistaken for any other species of western Mexico. The stems are essentially glabrous, but leaf surfaces, rachises, and calyces are densely and minutely stipitate- to subsessile-glandular; leaves are primarily basal and lower cauline and are oblanceolate and serrate-margined, and the short solitary spikes bear medium sized flowers with a prominently white throat. The strongly developed stem angles, thin leaves with non-revolute margins, and fruits with commissural faces reaching the nutlet tips suggest that *V. moctezumae* is most closely related to *V. menthifolia* Benth. and others of sect. *Verbena* ser. *Verbena* (Nesom 2010a).

Besides *Verbena menthifolia*, one other species of ser. *Verbena* is native to Mexico: *V. madrensis* Nesom (Nesom 2010b). Plants of *V. madrensis* are perennial and much larger than in *V. moctezumae* (25–60[–120] cm vs. 12–21 cm), but the two are similar in their single-stemmed habit, glabrate stems with strongly nerved angles, leaves with coarsely serrate margins, densely stipitate-glandular rachises and calyces, and nutlets with commissural faces reaching the tip. The *V. moctezumae* population system lies within the range of *V. menthifolia* but is far outside the range of *V. madrensis*. Compared to *V. menthifolia*, *V. moctezumae* is immediately distinguished by its shorter duration, small size, densely stipitate-glandular leaves, rachises, and calyces, and larger corollas.

1. Plants annual, stems 12–21 cm tall; spikes 1.5–5 cm; leaf blades 15–30 mm x 3–5 mm, coarsely serrate; leaf surfaces, rachises, and calyces densely stipitate-glandular; corolla tubes 4–4.5 mm, limbs 4–5 mm in diam.; nutlets ca. 2 mm long ..... **Verbena moctezumae**

1. Plants perennial, stems (30–)40–70 cm tall; spikes 10–20(–30) cm; leaf blades 25–45(–80) cm x 15–25(–40) mm, deeply toothed to pinnately lobed; leaf surfaces and calyces eglandular, rachises eglandular to sparsely glandular; corolla tubes 2.5–3 mm, limbs 1.5–3(–5) mm in diam.; nutlets 1.4–1.8(–2) mm long ..... **Verbena menthifolia**

The epithet of the new species reflects its geography—it is within Municipio de Moctezuma, whose largest settlement and municipal seat are the town of the same name. Moctezuma (ca. 1466–1520) was leader of the Aztec Empire, the last before the arrival of the Spanish in Mexico in 1517.

The new species is only known from the extensive (ca. 275 km^2) basalt flows south of the Sierra de la Madera and west of Moctezuma in east-central Sonora. The habitat is unique with regularly spaced black stones emerging from a dark, clay-rich soil derived from the eroding basalt. This soil becomes very sticky when wet and contracts when dry. The vegetation is foothills thornscrub, which occupies a broad area between Sonoran desertscrub to the west, tropical deciduous forest to the southeast, and oak woodland in the Sky Island mountain ranges and the Sierra Madre

Occidental to the east. On the Moctezuma lava plain, foothills thornscrub is of short stature and the trees are small and widely spaced. Other plants of interest from the same area include disjunct populations of *Viguiera purisimae,* a species of Asteraceae common in Baja California and southern California, and *Croton leucophyllus*, a Chihuahuan Desert species found from Texas southward. The holotype of *Melampodium moctezumum* was collected in the same habitat, 13.7 km NNW of Tepache on road to Moctezuma (Sonora Hwy 117) (*A.L. Reina G. 2003-943*, the type at TEX; Turner 2007).

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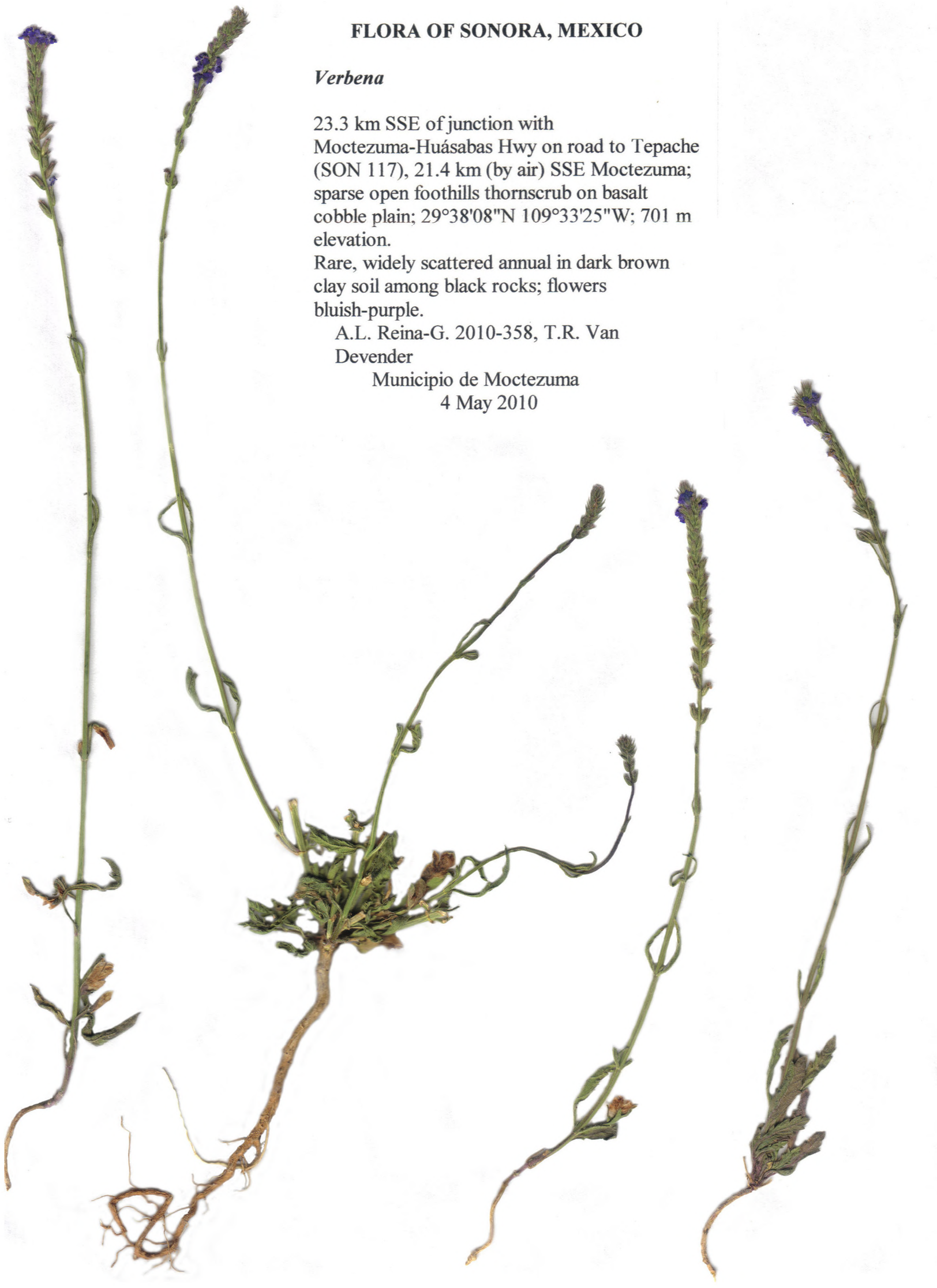
FLORA OF SONORA, MEXICO
Verbena
23.3 km SSE of junction with Moctezuma-Huásabas Hwy on road to Tepache (SON 117), 21.4 km (by air) SSE Moctezuma; sparse open foothills thornscrub on basalt cobble plain; 29°38'08"N 109°33'25"W; 701 m elevation.
Rare, widely scattered annual in dark brown clay soil among black rocks; flowers bluish-purple.
A.L. Reina-G. 2010-358, T.R. Van Devender
Municipio de Moctezuma
4 May 2010

Figure 1. Holotype of *Verbena moctezumae* (to be mounted).

Fig 2. *Verbena moctezumae*, Van Devender 2004-400.

Fig. 3. *Verbena moctezumae*, Reina-G. 2010-358, at type locality, on basalt rock.